



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 Issue: III Month of publication: March 2019

DOI: <http://doi.org/10.22214/ijraset.2019.3293>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

An Affordable Ecological Age Booking Considering Air Profanation Control

P. Pon Iswarya¹, M. Kanni Lakshmi², P. Packia Lakshmi³, J.Sugirtha⁴, L. Rachel ME⁵

^{1, 2, 3, 4}AP Electronics and communication engineering, chandy college of Engineering, Tuticorin

I. INTRODUCTION

With the fast development of the industrialization and urbanization process in the world, environmental pollution is now a common problem in most of the countries. Environmental pollution includes; air pollution, water pollution and soil pollution. Air pollution can be defined as the presence of contaminants or pollutant substances in the air that interfere with human health or welfare, or produce other harmful environmental effects. These pollutant substances usually result from vehicle emissions, Industrial emissions and volatile organic compounds. The health issues caused by air pollutants are difficulty in breathing, coughing and aggravation of existing respiratory and cardiac conditions. The World Health Organization states that 2.4 million people die each year from causes directly attributable to air pollution, with 1.5 million of these deaths attributable to indoor air pollution. Based on the fact mentioned above, there is a need to focus on air pollution monitoring activities. Air pollution refers to the release of pollutants into the air that are detrimental to human health and the planet as a whole. The Clean Air Act authorizes the Environmental Protection Agency (EPA) to protect public health by regulating the emissions of these harmful air pollutants. Rapid urbanization and industrialization cause increase in energy consumption and generate air and water and soil pollution from the particulate emission into the atmosphere caused by fuel combustion in energy production. There are no emission standards and norms for these polluting substances, and thus, environmental monitoring and inspection organizations cannot objectively measure the impact of air pollution, and effectively control it. The power industry makes a significant contribution to air pollution, a variety of air pollution control technologies have been adopted to reduce emissions of nitrogen oxides, sulfur dioxide, and particulate matters. However, the deployment of these technologies affects the operation of the power plants and of the power system. This paper we are going to collect the pollutant gas from the industry and filter the gas by using filter. After filtering the gas immaculateness level will test by using a sensor. At finally we use the purified air for producing electricity.

II. OBJECTIVES

Air pollution has become a major issue of modern megalopolis because of industrial emissions. When burned, these fossil fuels emit harmful gases including carbon dioxide and sulfur dioxide which increase the amount of greenhouse gases in the atmosphere resulting in global warming. To avoid the problem of air pollution, by filtering the polluted gases from the industries and use the filtering gas for producing electricity.

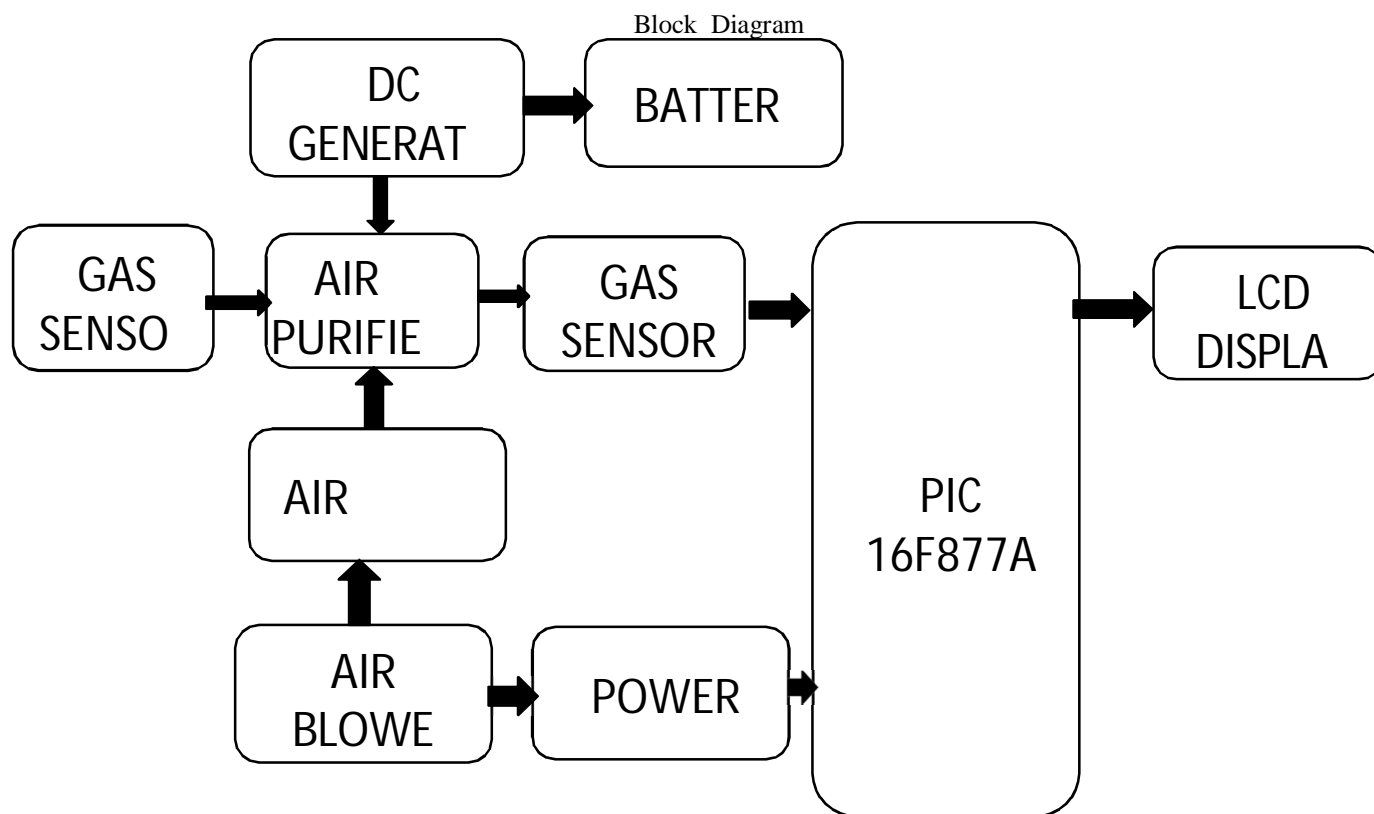
A. Existing System

Wireless Sensor Network Air Pollution Monitoring System (WAPMS)[2] to monitor air pollution in Mauritius through the use of wireless sensors deployed in huge numbers around the island. The proposed system makes use of an Air Quality Index (AQI) which is presently not available in Mauritius. In order to improve the efficiency of WAPMS, we have designed and implemented a new data aggregation algorithm named Recursive Converging Quartiles (RCQ). The algorithm is used to merge data to eliminate duplicates, filter out invalid readings and summarise them into a simpler form which significantly reduce the amount of data to be transmitted to the sink and thus saving energy. For better power management we used a hierarchical routing protocol in WAPMS and caused the motes to sleep during idle time. The limitations are maintenance cost is high and less durability then filtering gas will mixed with atmosphere, it is not efficient.

B. Proposed System

There is no intervention in the production since we are controlling it. A pollution sensor can only detect pollutants that come into contact with it, and thus such a sensor does not have a detection zone like presence sensors. The majority of deployment approaches uses a simple detection model which assumes that a sensor is able to cover a point in the environment if the distance between them is less than a radius called the detection range. A pollution sensor detects pollutants that are brought in contact by the wind. In this

project, purifying the polluted air and producing electricity from the purified air. The design consists of air filter bus, gas sensor, LCD and the controller. The power industry makes a significant contribution to air pollution, a variety of air pollution control technologies have been adopted to reduce emission of gases from industries. However the deployment of these technologies affect the operations of the power plants and power system. This paper we are going to collect the polluted gas from the industries. the polluted gas are purified by using air filter. Then the purity level was tested by using gas sensor. the DC generator produce the electricity and it displayed in LCD. The PIC microcontroller was control all the process.



III. CONSTRUCTION

Schematically illustrates the construction is

A. Air Blower

A blower is a machine for moving volume of a gas with moderate increase of pressure. The specific ratio means discharge pressure over suction pressure. The specific ratio of the blower is 1.11 to 1.20 and the pressure rise is 1136 to 2066.

B. Gas Sensors

Arduino MQ-2 gas sensor module are used in gas leakage detecting equipment's in family and industry, are suitable for detecting of LPG, i-butane propane, methane, alcohol, hydrogen, smoke. It has wide detecting scope and fast response time and high sensitivity. Sensitive material of MQ-7 gas sensor is SnO₂, which with lower conductivity in clean air. It make detection by method of cycle high and low temperature, and detect CO when low temperature (heated by 1.5V). The sensor's conductivity is more higher along with the gas concentration rising. When high temperature (heated by 5.0V), it cleans the other gases adsorbed under low temperature.

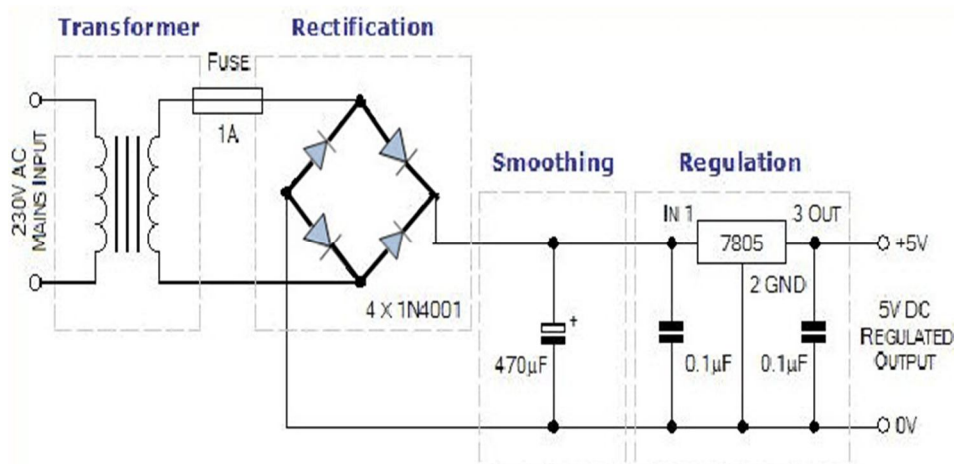


C. Air filter

Air in and out- 35.352 cc for a chimney in the kitchen with diameter 150 mm and height 300 mm. In industries, depending upon the boiler, air filter is designed. It use a pleated paper filter element in the form of a flat panel. This filter is usually placed inside a plastic box connected to the throttle body with ductwork. It use a cylindrical air filter, usually a few inches high and between (300mm) and (150 mm) in diameter. This is positioned above the carburetor or throttle body, usually in a metal or plastic container which may incorporate ducting to provide purified air to the environment with 35.35cc .The overall unit is called the air cleaner which purifies the pollutant gases. Filters containing an absorbent or catalyst such as charcoal (carbon) may also remove odors and gaseous pollutants. It is used to remove the contaminants in air. The HEPA (High efficiency particle air filter)[4] super fine glass fiber paper could achieve 99.9998% efficiency for >0.3micro meter dust.

D. Power Supply Unit

It involves Step down transformer to convert 230vAC to 12v AC. Bridge rectifier to convert 12V AC to 12V DC. Voltage regulator will convert 12V DC to 5vDC.



E. PIC 16F 877A Microcontroller

PIC16F877A have enough 33 I/O (Input/output) lines for current need. The master controller controls each functions of the system with a supporting device. It is also responsible for reception of commands from the host and taking necessary actions. This powerful (200 nanosecond instruction execution) yet easy-to-program (only 35 single word instructions) CMOS (Complementary metal-oxide semiconductor) FLASH-based 8-bit microcontroller packs. The PIC16F877A features 256 bytes of EEPROM data memory, self-programming, 2 Comparators, 8 channels of 10-bit Analog-to-Digital (A/D) converter, the synchronous serial port can be configured as either 3-wire Serial Peripheral Interface (SPI) or the 2-wire Inter-Integrated Circuit bus and a Universal Asynchronous Receiver Transmitter (USART).

F. Generator

DC motor acts as a Generator. DC motor produces mechanical energy from electrical energy. By reversing the process of the dc motor, electrical energy will be converted into mechanical energy.

G. LCD

It is connected to the port B of the controller. It reads the data from the memory about gas in and gas out, The energy generated by the purified air and write it in the display. 16 x 2 display is used.

IV. OPERATIONS

First we are collecting the polluted gas by using air blower .The gas sensor are sense the polluted level. Then the process of air purifier by purifying the polluted air and the purity level is checked by using gas sensor. The purifying air is given to a fan. The fan is rotated and the DC generator produced the electricity. This is stored in and it can be used. The level of producing electricity is displayed in LCD. All the process was controlled by PIC microcontroller. At finally producing electricity using polluted air.



V. CONCLUSION

The experimental set up is used to reduce the air pollution. This system used to produce more emission industries because the polluted air is purified and producing electricity.

REFERENCES

- [1] Sayantani Bhattacharya, S Sridevi and R Pitchiah. Indoor air quality monitoring using wireless sensor network. In sensing technology (ICST), 2012 Sixth International Conference on pages 422-427, IEEE, 2012
- [2] Kavi K. K. Khedo, Rajiv Perseedoss and Avinash Mungur. Wireless sensor networks air pollution monitoring system. International journal of wireless & mobile networks vol 2, no. 2, May 2012.
- [3] Senichi Masuda, Xiang-Ling Tu, Masumi Tsutsumi. The performance of an integrated air purifier for control of aerosol, microbial and odor. IEEE vol 29, no 4.
- [4] Liu, G., Xiao, M., Zhang, X., Gal, C. and Clements, C. D. 2012. A review of air filtration technologies for sustainable and healthy building ventilation. 375-396.





International Journal for Research in Applied Science & Engineering Technology (IJRASET)

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887

Volume 7 Issue III, Mar 2019- Available at www.ijraset.com



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)